



AQ GUARD SMART SYSTEM

# AIR QUALITY MEASUREMENT

High-Resolution Real-Time Monitoring

*Made in Germany*

# Precise Determination of Air Quality With **AQ GUARD SMART SYSTEM**

How can air pollution be reduced in the future? To answer this question, reliable, continuous, and flexible measurements of particulate matter concentrations and distributions are required, allowing conclusions to be drawn on the cause and predictions.

The lightweight and easy-to-use measuring devices of the **AQ GUARD SMART SYSTEM** are suitable as a supplement to regulatory measurements, for monitoring and controlling safe working conditions, and for temporary or permanent air quality monitoring at roadside locations, construction sites, or industrial plants.



With the introduction of the **AQ GUARD SMART SYSTEM**, the proven Palas technology of optical particle measurement is now supplemented in one family by innovative gas sensor technology and technology for measuring ultra-fine particles in the air.

If required, the devices can be equipped with additional accessories: for example, climate sensors or signal technology for alarming.

The **AQ GUARD SMART SYSTEM** is MyATMOSPHERE-ready. The measurement data can be transmitted via the Palas Cloud MyAtmosphere.



# Application Examples



**NETWORK WITH ROADS, RAILS & PORTS**



**SMART CITY**



**OPEN PIT MINING & LANDFILLS**



**CONSTRUCTION SITES**



**INDUSTRY**



**NATURAL RISK AREAS**

# Principle of Operation

**AQ GUARD SMART SYSTEM** is a robust aerosol spectrometer for ambient air. The model **AQ GUARD SMART 1X00** uses the principle of optical scattered light measurement on single particles based on the EN 16450 certified FIDAS® 200 technology. The model **AQ GUARD SMART 2000** for ultra-fine particles works on the principle of diffusion charging.

**AQ GUARD SMART 1X00** is MCERTS Indicative certified for PM<sub>2.5</sub> and PM<sub>10</sub>.

**AQ GUARD SMART SYSTEM** uses state-of-the-art polymer electrolyte sensors to determine gas concentrations of SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, and CO. Compared to liquid electrolyte technology, these sensors are characterized by durability and long-term stability.

The device can be equipped with a weather station to understand better and interpret immissions and their origin. Sensors for recording temperature, humidity, and pressure are integrated as standard.

**AQ GUARD SMART SYSTEM** can be operated over more extended periods without recalibration. Deviations in the particle size determination and thus drifts of the PM values are determined by a specific analysis of the particle size distribution and displayed and reported when a tolerance threshold is exceeded as part of the self-monitoring.



# AQ GUARD SMART SYSTEM

## **AQ GUARD SMART 1000** FOR PARTICLE MEASUREMENT OF AMBIENT AIR

- $PM_{1'}$ ,  $PM_{2.5'}$ ,  $PM_{4'}$ ,  $PM_{10'}$ , TSP,  $C_N$ , particle size distribution, pressure, temperature, relative humidity

## **AQ GUARD SMART 1100** FOR PARTICLE MEASUREMENT OF AMBIENT AIR WITH GAS SENSORS

- $PM_{1'}$ ,  $PM_{2.5'}$ ,  $PM_{4'}$ ,  $PM_{10'}$ , TSP,  $C_N$ , particle size distribution, pressure, temperature, relative humidity, as well as:  $SO_2$ , CO,  $NO_2$ ,  $O_3$

## **AQ GUARD SMART 1200** FOR PARTICLE MEASUREMENT OF AMBIENT AIR WITH EXTENDED GAS SENSORS AND GPS

- $PM_{1'}$ ,  $PM_{2.5'}$ ,  $PM_{4'}$ ,  $PM_{10'}$ , TSP,  $C_N$ , particle size distribution, pressure, temperature, relative humidity,  $SO_2$ , CO,  $NO_2$ ,  $O_3$ ,  $CO_2$  (NDIR sensor)

## **AQ GUARD SMART 2000** FOR MEASUREMENT OF ULTRA-FINE PARTICLES IN AMBIENT AIR

- $C_N$ : 1,000– $10^6$  particles/cm<sup>3</sup>,  $D < 0.01$ – $1 \mu m$ , pressure, temperature, relative humidity, average diameter X50, LDSA (Lung Deposited Surface Area)

# Special Advantages and Benefits

## LATEST TECHNOLOGY

- High accuracy and reproducibility of the fine dust values
- Short-term commissioning and immediate recording of measured values via the cloud MYATMOSPHERE
- Situation-specific configuration via Wi-Fi hotspot, remote access, and external touchpad
- Extensive communication capabilities
- Expandable with a weather station for better assessment and evaluation of particulate matter data and other parameters
- Compact size and easy installation

## DIFFERENT MEASUREMENTS

- Measurement of particle mass concentrations with high temporal resolution and optional gas sensor technology as well as concentration of ultra-fine particles down to 10 nm in size
- Continuous, simultaneous real-time measurement in second-by-second resolution

## EXTENSIVE OUTPUT OPTIONS

- Visualization and real-time transmission of the measured data and their cause without post-processing or applying corrections

# Technical Features

	AQ Guard Smart 1X00	AQ Guard Smart 2000
Measuring principle	Optical light scattering of single particles; Solid Polymer Electrolyte (AQ GUARD SMART 1100   1200)	Diffusion charging
Reported data	PM <sub>1</sub> , PM <sub>2.5</sub> , PM <sub>4</sub> , PM <sub>10</sub> , TSP, C <sub>N</sub> , particle size distribution, pressure, temperature, relative humidity, SO <sub>2</sub> , CO, NO <sub>2</sub> , O <sub>3</sub> , CO <sub>2</sub>	C <sub>N</sub> , average diameter X50, LDSA (Lung Deposited Surface Area), pressure, temperature, relative humidity
Measurement range (number C <sub>N</sub> )	0–20,000 particles/cm <sup>3</sup>	1,000–10 <sup>7</sup> particles/cm <sup>3</sup>
Measurement range (size)	0.175–20 µm	0.01–1 µm
Measurement range (mass)	0–100 mg/m <sup>3</sup> (depending on aerosol composition)	
Interfaces	USB, Ethernet (LAN), Wi-Fi, 3G/4G via modem, optional: LoRaWAN GPS (AQ GUARD SMART 1200)	
Protocols	UDP, ASCII, Modbus	
Data management	Prepared for connection to the Palas Cloud MyATMOSPHERE („MyATMOSPHERE-ready“)*	
Installation conditions	-20–+50 °C	
Dimensions (H • W • D)	530 • 270 • 208 mm	
Special features	Heated inlet, mast / tripod mount	

\*separate registration required; cloud license fees may apply and/or SIM card required

Subject to technical changes



Palas is a leading developer and manufacturer of high precision instruments for the generation, measurement and characterization of particles in air.

With more than 30 active patents, Palas develops technologically leading and certified fine dust and nanoparticle analyzers, aerosol spectrometers, generators and sensors as well as related systems and software solutions. Palas was founded in 1983 and employs more than 100 people.

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